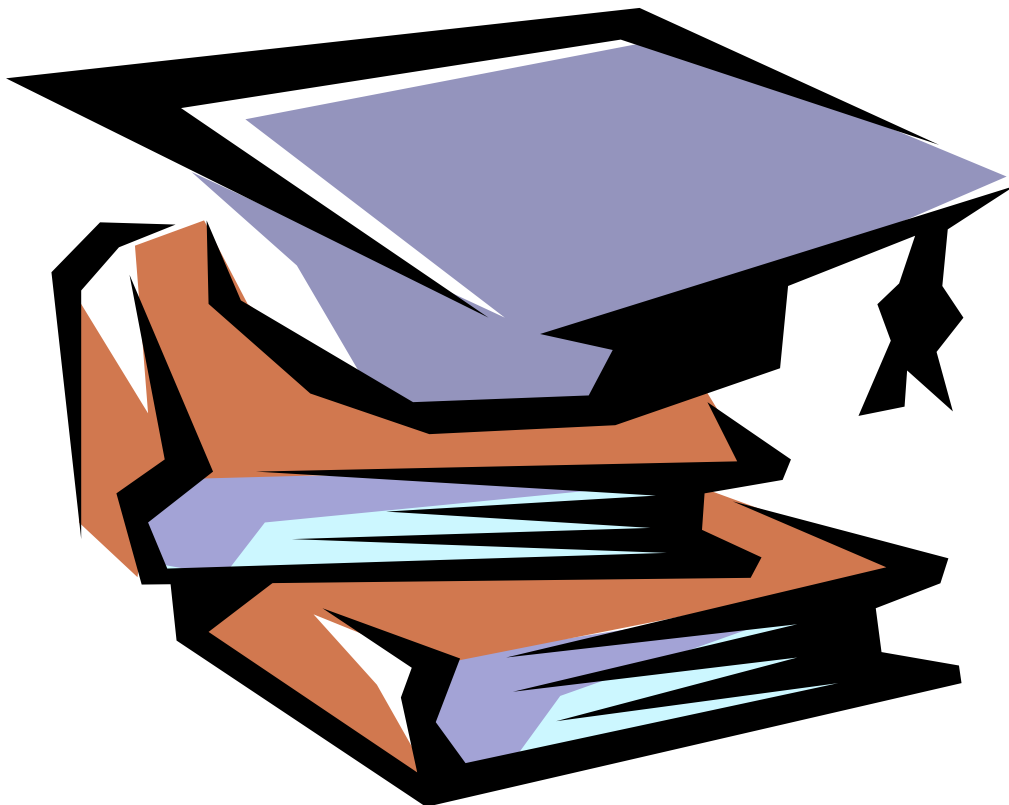


Preparation Guide for
Entry-Level Economist Assessment
Bureau of Labor Statistics



PREPARATION GUIDE
For
ENTRY-LEVEL ECONOMIST ASSESSMENT
(Bureau of Labor Statistics)

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INTRODUCTION

The purpose of this guide is to help you prepare for the Bureau of Labor Statistics Economist Assessment. The test has two parts. Part A consists of 25 Logical Reasoning questions, and Part B consists of 25 Quantitative Reasoning questions. You will be allotted 75 minutes for each part, with a short break in between the two parts.

The Bureau is testing you for your logical and quantitative reasoning skills because several panels of senior economists and other experts have analyzed the job of government economist and determined that these skills are essential for successful job performance. The content of the questions is based on Bureau documents and reports. However, this is not an assessment of your specialized knowledge of economics (e.g., your knowledge of economic theory, methods, or history). It is an assessment of your ability to think logically, analyze, and draw correct conclusions about matters involving elementary economic concepts or terminology. If you can do that, you are likely to be successful in the job of BLS economist. Accordingly, your score on this assessment is probably a good predictor of your success on the job.

This guide includes a few sample verbal and quantitative reasoning questions. You should try answering them for practice. You will also find brief explanations of why each correct response choice is correct, and why each incorrect response choice is incorrect. Preceding each set of sample questions are “Test Taking Tips” to help you do your best on the assessment.

Two general test-taking tips apply to both sections. First, remember that you do not have to answer the questions in order. If an item seems difficult, you can stop working on it and return to it later. It is probably best not to spend more than 2 ½ to 3 minutes per item the first time through. Second, there is no penalty for guessing. So it may pay to guess as a last resort, if you really cannot get the answer, especially if you can rule out some of the alternatives.

PART A: LOGICAL REASONING (VERBAL)

Question Format

Each question in this part of the assessment starts with a reading passage containing the information to be used to choose between correct and incorrect logical conclusions. These conclusions are based on the information in the passage. After this reading passage, you are given a lead-in phrase that tells you to choose from among five different responses. These possible responses are generated by correctly or incorrectly applying logical thought to the information in the passage at the beginning of the question. They can be thought of as different ways of completing a sentence that begins with the lead-in phrase.

Each reading passage is based on actual Bureau of Labor Statistics documents but is not necessarily a completely accurate representation of BLS work. It is important that you **accept every fact in the reading passage as true**, when you evaluate the response choices offered. You should use **only** the information in the passage as the basis for accepting or rejecting any response choices. Be careful not to allow any “facts” that are not clearly stated in the reading passage, or any outside knowledge you may have of the “facts”, to influence your thinking.

The lead-in phrase following each reading passage prompts you to select from among five response choices, labeled A through E, so that a complete and valid sentence is formed. The lead-in may ask you to select the statement that is a **necessary** consequence of the facts given, (that is, a conclusion that must be true from the facts given). This lead-in takes the general form:

“From the information given above it can be validly concluded that...”

You should respond here by selecting the alphabetical designator (A-E) of the statement that satisfies the stated condition, that is, a “valid conclusion.”

Alternatively, the phrase may ask you to identify a conclusion **that is not necessarily true** (in that sense, “false,”) given the facts contained in the reading passage. This kind of lead-in generally reads as follows:

“From the information given above it CANNOT be validly concluded that...”

Here you should choose the letter (A-E) next to the statement that is not adequately supported as necessarily true by reasoning from the facts you were given in the reading passage.

If additional conditions are clearly stated in the sentence-completion instructions, then take them into account when making your answer choice. For example, if the instructions said:

*“From the information given above it can be validly concluded that, **in the State of Nevada in 1999...**”*

your response choice should be valid for “the State of Nevada in 1999,” in addition to following validly from the reading passage itself. Do not assume any of these additional limiting conditions. Only apply those that are stated.

In all cases, there will be a *single* correct response alternative. *None* of the questions here (or on the actual assessment) have multiple correct answers.

Test-Taking Tips for Logical Reasoning

Before you try to answer a few sample questions, here are some general test-taking tips that should help you with the Logical Reasoning section.

1. Study the question carefully. A brief explanation of why each choice is correct or incorrect follows each practice question. If you understand this reasoning for the practice items, you will do well on the actual assessment.
2. NEVER assume or use any information that the question fails to give you. This is NOT an assessment of how much you know about economics in general! Consider ONLY the information given in each reading passage when choosing among the alternative responses.
3. Read both the factual passage and the sentence completion instruction carefully. Both must be considered in making your choice.
4. Be sure to read all the response choices carefully before choosing one.
5. In questions that ask you to select a valid conclusion, always choose the one conclusion that must definitely follow from the information you are given. In questions that ask you to find the invalid alternative, choose the one conclusion that does not definitely follow from the information.
6. Pay special attention to words like “all,” “some,” or “none” when you read the factual information each question gives you. Other qualifying words such as “other than,” “only” or “unless” are important, too. These words can play a critical part in precisely specifying the facts to be used in your reasoning.
7. Pay attention to negative prefixes also, such as *non-*, *un-*, or *dis-*. These can be crucial to specifying the basic facts in the paragraph.
8. “Test-taking” courses or your college instructors may have advised you to avoid any response choices that contain the quantifiers “all” or “none.” In both the practice questions here and in the actual economist assessment, these words are NOT signs of incorrect response choices. They will appear in both correct and incorrect response choices.

9. Pay close attention to the word “ONLY” and to the phrase “IF AND ONLY IF.” Saying “The door will open IF AND ONLY IF both keys are used” sets up a highly specific condition that must be met. There is exactly one way to open the door—you must use both keys. By contrast, if the sentence says, “The door will open if the key is used,” there may be several ways to open the door besides by using the key.
10. The questions in the assessment will vary in difficulty level, and difficult questions will be mixed in with easier ones throughout the assessment. When you encounter a question that is difficult for you, try drawing diagrams or other schematic notes on the “scratch” paper provided to support and confirm your thought processes. Also, bear in mind that you can stop working on a difficult question temporarily and return to it later.

SAMPLE QUESTIONS

Question 1

Although most of the fastest growing jobs in today's economy will require a college degree, many of the new jobs being created—from home health aide to desktop publisher—require knowledge other than that gained from earning a degree. For workers in those jobs, good basic skills in reading, communication, and mathematics play an important role in getting a job and developing a career.

From the information given above it can be validly concluded that, in today's economy,

- A) skills in reading, communication, and mathematics play an important role in developing a career as a desktop publisher
- B) the majority of the new jobs being created require knowledge other than that gained from earning a college degree
- C) a job as a home health aide will rely more on communication skills than on basic skills in reading and mathematics
- D) if a job is one of the fastest growing jobs, it will require a college degree
- E) desktop publisher jobs and home health aide jobs are not among the fastest growing jobs

Which letter corresponds to the correct response? _____

(Now turn the page to check your answer.)

The correct response is **A**. This is because it connects the facts given in the passage logically. The first fact states that “in today’s economy...*many* new jobs being created ...require...good basic skills in reading, communication, and mathematics.” Note that this fact also acknowledges the condition “in today’s economy” that is included in the lead-in phrase to the five choices. The second fact is that “desktop publisher” is one of the types of new jobs that will require the skills the passage spells out.

Response B is incorrect because the passage does not give you enough information to be certain that Response B is necessarily true (although it might be.) While the passage states that *many* new jobs require knowledge “other than that gained from earning a degree,” “many” does not necessarily mean “the majority,” that is, “more than half.”

Response C also does not follow necessarily from the information given. While the passage states that “good basic skills in reading, communication, and mathematics” are important for new jobs such as home health aide, it does not indicate which (if any) of these skills is more important than the others for the new jobs listed. Therefore, Response C’s assertion that “...a home health aide will rely more on communication skills...” is not supported by the facts as given.

Response D is incorrect because the facts given do not state that *all* of the fastest growing jobs require a college degree—only that “most” will. This response would be true only if the word “all” had been used instead of “most.” Remember that a valid (in this case, correct) response must be necessarily true from the facts given—not just “possibly” or even probably true.

Response E states definitely that “desktop publisher and home health aide jobs” are **not** “among the fastest growing jobs.” Again, this does not necessarily follow from the facts provided. The passage merely includes these two jobs in a class of new jobs being created in today’s economy, but says nothing about how fast these jobs are growing.

Question 2

According to the National Agricultural Aviation Society (NAAS), without the use of crop protection products to control insects, weeds, and diseases, crop yields per acre will drop by more than 50 percent. The first aerial application of insecticide occurred in 1921, and it was a huge success. By contrast, in today's economy all aircraft that are classified as aerial applicators do more than just apply insecticide; today, they also spread seed and apply fertilizer.

From the information given above it CANNOT be validly concluded that

- A) in today's economy, if an aerial applicator is used, then it will be able to spread seed and to apply fertilizer
- B) according to the NAAS, if crop yields per acre never drop by more than 50 percent, then crop protection products have been used to control insects, weeds, and diseases
- C) in today's economy, any aircraft that cannot be used to apply fertilizer cannot be classified as an aerial applicator
- D) in 1921, if an aircraft was used for the application of insecticide, then it was not also used to spread seed
- E) according to the NAAS, if crop yields per acre drop by more than 50 percent, then crop protection products have not been used to control insects, weeds, and diseases.

Which letter corresponds to the correct response? _____

(Now turn the page to check your answer.)

The correct response is **E**. The lead-in phrase for this question specifies that the correct choice is the one statement (A-E) that is not necessarily true from the facts given. The reading passage indicates only that, according to the National Agricultural Aviation Society (NAAS), crop protection products are one measure that must be used to avoid a drop of more than 50 percent in crop yields per acre. However, this does not rule out the possibility that there are additional protective measures that must *also* be taken to avoid such a drop. Note that option E is the only statement not necessarily true from the information given. Responses A, B, C, and D are **incorrect**, given what the lead-in phrase asks for, because they all follow necessarily from the information in the passage.

In the case of response A, the last statement in the passage clearly defines aerial applicators in today's economy as aircraft capable of spreading seed and applying fertilizer.

Response B is valid in light of the following information given: "According to the National Agricultural Aviation Society (NAAS), without the use of crop protection products to control insects, weeds, and diseases, crop yields per acre will drop by more than 50 percent." Since Response B refers to a future time at which crop production has remained above 50 percent of current levels, the quoted statement makes it clear that crop protection products must have been in use. (Note here that, unlike Response E, it is not necessary for the passage to state anything about any other measures needed to sustain crop levels above 50 percent of their current levels. The response states that the crop production levels *have* remained above 50 percent. Since using crop protection products is a *necessary* condition for that outcome, the statement is valid.)

Response C is valid because it simply repeats, in different form, the statement made in the reading passage that in today's economy all aircraft classified as aerial applicators can also be used to apply fertilizer (among other substances.)

Response D is valid because of the joint effect of two pieces of the information given in the passage. First, according to the passage, aerial application of insecticide first occurred in 1921. Second, and by contrast (in today's economy), aerial applicators do more than they did in 1921. (Now they also spread seed and apply fertilizer.) Thus, in 1921 aircraft were used to apply insecticide, but not to spread seed, fertilizer, etc.

Question 3

No national productivity measures are available for underground industries that may exist but remain unreported. On the other hand, at least some industries that are run entirely by self-employed industrialists are included in national productivity measures.

From the information given above, it can be validly concluded that

- A) there are at least some industries run entirely by self-employed industrialists that are underground industries
- B) no industries that are run entirely by self-employed industrialists operate underground
- C) there are at least some industries other than those run entirely by self-employed industrialists that are underground industries
- D) there are at least some industries run entirely by self-employed industrialists that are not underground industries
- E) there are at least some underground industries for which national productivity measures are available

Which letter corresponds to the correct response? _____

(Now turn the page to check your answer.)

The correct response is **D**. The first sentence in the reading passage states that there are no national productivity measures for any industry properly labeled “underground.” The second sentence states that *some* industries run entirely by self-employed industrialists are included in the national productivity measures. Therefore, we can be sure that these latter industries are not “underground.”

Response A does not follow necessarily from the facts given. It is possible that there are some industries run entirely by self-employed industrialists that do fit the definition of “underground industry”. (It also possible that *none* fits that definition, but neither of these possibilities is a *necessary* conclusion from the information given.)

Response B is an incorrect choice for reasons similar to those that make response A incorrect. Response B, like response A, depends on having facts about **all** “*industries run entirely by self-employed industrialists*.” But the information given about such industries applies only to **some** of them—not all.

Response C is also incorrect. The basic fact provided about industries that are run entirely by self-employed industrialists is that *some* of them are included in national productivity measures. Because *no* “underground” industries are included in national productivity figures, you can validly conclude that some (i.e., at least one) industries run by self-employed industrialists are not operating underground. But you cannot *necessarily* conclude from these same facts that there are *some* industries “*other than those*” run entirely by self-employed industrialists that *do* operate underground—and this is what Response C states.

Response E is incorrect for two reasons. First, it contradicts the fact given that no national productivity measures are available for underground industries (without exception.) Second, it states **positively** that underground industries exist, whereas the passage says only that “underground” industries *may* exist.

Closing Comments on the Logical Reasoning Part

This type of verbal logical reasoning assessment item is probably somewhat unfamiliar to you. It assesses your skill at drawing correct conclusions by discerning the underlying logical relationships described in the reading passage. Because the item type is unfamiliar, working through the practice items above will be especially helpful.

The important point to identify in answering the question is whether responses follow ***necessarily*** from the facts given in the reading passage. You must read the questions carefully and determine which response *must* necessarily follow logically when you are asked to find the valid response. When you are asked to find the invalid response, your task is to determine which response *does not necessarily follow* logically from the facts given.

You do not need training in formal logic to do well on this assessment. However, if you want to learn more about logic, you can consult any introductory textbook on the subject available typically in the philosophy or mathematics sections of libraries or bookstores.

PART B: QUANTITATIVE REASONING

Each question in the Quantitative Reasoning portion of the assessment contains a reading passage followed by a lead-in phrase which states the specific question and introduces four (or five) response options.

The Reading Passage

Every reading passage in the Quantitative Reasoning section is based on examples of BLS economist work. However, there may be differences between the examples and real BLS data or analyses. It is important that you accept every fact presented in the reading passage as true and that you use *only* the information given in the passage to draw your conclusions.

The Lead-In Text and the Response Choices

A lead-in phrase or sentence follows every reading passage. The lead-in asks you to complete a sentence by selecting one among four response choices, labeled A through D. In many cases, there is also a fifth option labeled E, with the response choice “none of these.”

Use Your Calculators!

In this assessment, you are encouraged to use calculators. This is primarily an assessment of your quantitative reasoning ability, not computational skills. In some cases, though, the calculations are complex enough that using a calculator will save you time and help ensure accuracy.

The assessment administrator will not be able to provide each applicant with a calculator, so please bring your own calculator to the assessment if you want to avoid doing all calculations by hand. You will not need a graphing, programmable, or scientific calculator. Any calculator capable of performing the four basic operations (addition, subtraction, multiplication, and division) that also has a square root function will be adequate.

Test-Taking Tips for Quantitative Reasoning

Refer to the test taking tips in the Logical Reasoning section. For the most part, they apply to the quantitative section as well.

1. **READ THE QUESTION CAREFULLY!** Make sure you understand exactly what you are being asked to do.
2. Use your calculator! It will save you time and effort, and help you make accurate calculations.
3. Answers will often not work out to whole numbers or simple fractional values, as may have been the case on other standardized tests you have taken. This is another reason why calculators are recommended for this assessment.

4. Use the scratch paper provided.
5. If you are forced to guess because you cannot solve a problem or run out of time, do not be too quick to select the “none of the above” option. This response is no more likely to be correct than any of the other alternatives. Instead, try to rule out response choices before you make your guess.
6. Review and practice working some problems in the topic areas listed below, especially if you have not worked with the concepts recently.

Topics covered in the Quantitative Part

You are expected to understand and use correctly a wide variety of basic mathematical concepts covered in most introductory level college mathematics courses.

This is an assessment of your basic quantitative skills, not your knowledge of advanced mathematics or economics. There is no calculus or matrix algebra, no econometrics or economic theory on the assessment. Although you might be tested on your understanding of linear regression, you will not be asked to develop any regression equations.

You should be prepared to solve problems involving such topics as:

- Decimals, fractions, and rounding procedures
- Probability
- Percentage and percentage change
- Basic statistics, including
 - Measures of central tendency (mean, median, and mode)
 - Weighted average
 - Standard deviation, variance, and other measures of dispersion
- Ratios and proportions
- Inequalities
- Linear equations
- Non-linear functions (e.g., rate of change, growth rates)
- Graphs and charts

SAMPLE QUESTIONS

Question 1

From 1992 to 1998, 2,139 fatalities resulted from job-related aircraft accidents. Of these fatalities, 853 were pilots. The other victims were “on the job” when they died and not employed as pilots.

According to the Federal Aviation Administration, the leading cause of aviation accidents is pilot error. During the period mentioned above, pilot error was cited as either a cause or a contributing factor in 77% of all aviation accidents and in 83% of fatal aviation accidents.

From these data it can be concluded that, during 1992 – 1998,

- A) For aircraft accidents attributed to pilot error, the total number of non-fatal aircraft accidents was 6% less than the total number of fatal aircraft accidents
- B) Slightly over 60% of fatalities resulting from job-related aircraft accidents occurred to non-pilots
- C) The total percentage of aircraft accidents for which pilot error cannot be cited as a contributing factor (or cause) is approximately 17%
- D) Less than 20% of all aircraft accidents involved no pilot fatalities
- E) None of these

Which letter corresponds to the correct response? _____

(Now turn the page to check your answer)

The correct response is **B**. According to the passage, there were 2,139 fatalities resulting from job-related aircraft accidents during 1992-1998. Of these, 853, or approximately 39.88% (i.e., $853 \div 2,139$), involved pilot fatalities. Therefore, as stated in response B, slightly over 60% of fatalities (i.e., $100\% - 39.88\%$) occurred to non-pilots.

Response A is incorrect. The figure 6% is obtained by subtracting 77% from 83% in the question. But this subtraction is invalid because the two percentages are based on different total numbers. The 77% figure refers to all accidents (fatal and non-fatal), whereas the 83% refers to *fatal* accidents only.

Response C is also incorrect. The assertion in response C is that in approximately 17% of aircraft accidents, pilot error was not cited as a contributing factor. Option C does not limit the types of “aircraft accident”. Therefore, it must refer to “all” aircraft accidents. The 83% figure in the passage refers to *fatal accidents* only. Therefore, 17% can only represent the percentage of *fatal* accidents not caused by pilot error. On the other hand, the passage states that pilot error was a cause or factor in 77% of *all* accidents. From this it follows that pilot error was *not* a factor in approximately 23% of all accidents.

The claim in response D that “less than 20% of all aircraft accidents involved no pilot fatalities” again involves subtracting 83% from 100% to get 17%. This misinterprets the 83% figure as applying only to *those accidents in which there were pilot fatalities*. The 83% figure actually refers to *the percentage of all fatal accidents where pilot error was a contributing factor or cause*.

Question 2

In July 1998, the following data were published for four categories of blue-collar workers in private industry in Huntsville, Alabama.

<u>Occupation</u>	<u>Number of workers</u>	<u>Mean hourly earnings</u>
1. Precision production, craft, and repair occupations	7,235	\$ 13.61
2. Machine operators, assemblers and inspectors	13,122	\$ 14.08
3. Transportation and material moving occupations	1,391	\$ 10.87
4. Handlers, equipment cleaners, helpers, and laborers	2,910	\$ 9.05

Based on these data, the mean hourly earnings, rounded to the nearest cent, of a blue-collar worker who worked in private industry in Huntsville, Alabama, in 1998 was

- A) \$ 11.90
- B) \$ 11.91
- C) \$ 13.16
- D) \$ 13.17
- E) None of these

Which letter corresponds to the correct response? _____

(Now turn the page to check your answer)

The correct response is **D**. This is a problem calling for calculation of a weighted average (mean) of the employee salaries to take into account the different numbers of employees in each of the four employee categories listed. Here is a step-by-step description of the proper way to calculate the weighted (overall) average wage:

- Compute the total hourly earnings of workers in each separate category by multiplying the mean hourly wages for each category by the number of workers in that category. Thus, the total hourly earnings for all workers is \$324,681.78, or the sum of \$98,468.35 + \$184,757.76 + \$15,120.17 + \$26,335.50.
- Calculate a grand total of hourly earnings for all workers (\$324,681.78) by summing the four values (see table below). Then divide this grand total by the grand total number of blue-collar workers (24,658), to yield the overall mean hourly salary of \$13.17 for all Huntsville blue-collar workers in private industry (rounded to the nearest cent.)

Employee Category	# of employees	Mean hourly salary	# employees X mean hourly salary
1	7,235	\$13.61	\$ 98,468.35
2	13,122	\$14.08	\$184,757.76
3	1,391	\$10.87	\$ 15,120.17
4	2,910	\$9.05	\$ 26,335.50
Grand Total	24,658	\$13.17	\$324,681.78

Response A ignores the need to calculate a weighted mean. Thus, it reflects an average based on the sum of the mean hourly earnings listed for each of the four categories, i.e., $\$13.61 + \$14.08 + \$10.87 + \$9.05 = \$47.61$; $\$47.61 \div 4 = \11.90 (rounded to the nearest cent), without any weighting by (adjustment for) the differing numbers of people in each category.

Response B makes the same error as response A, but incorrectly rounds off to \$11.91 from \$11.9025. Response C correctly computes a weighted average, but the answer is incorrectly rounded to \$13.16 from \$13.1674.

Question 3

Game testers play games for a living. They play each and every part of a game in order to identify possible errors in video game software, so the errors can be fixed before the software is shipped to stores. In a recent year, testers found that among all the games that they tested, 12% contained technical errors (for example, game characters who walked through walls, and sound or artwork that disappeared unpredictably). Nine percent (9%) contained errors in the game-play itself (e.g., portions that were too difficult, too easy, or too confusing for members of the intended audience.) The testers found that these two types of error were independent of one another.

From this information it follows that, if a game is selected at random from all the games that were tested, the probability that it will be found to contain both types of error

- A) Cannot be estimated
- B) Is between 0.01 and 0.02
- C) Is equal to 0.12
- D) Is between 0.19 and 0.20
- E) None of these

Which letter corresponds to the correct response? _____

(Now turn the page to check your answer)

The correct response is **B**. The error rates of 12% (or 0.12) and 9% (or 0.09) apply to “all the games that were tested” and so they can be used to solve the problem as posed. The probability of the joint occurrence of two independent events (in this case, a technical error and a game-play error) is equal to the product of the individual probabilities of occurrence. In this case, the joint probability equals 0.12 times 0.09 or 0.0108. Therefore, the probability value for the conjunction is between 0.01 and 0.02, which is within the range given by response B.

Response A is incorrect in claiming that the probability cannot be estimated. The estimation has just been demonstrated.

From the information given, the error in response C probably involves assuming that all pieces of software with a game-play error (12%) also contain a technical error. This would contradict the information given, which is that the two types of error occur independently.

The task in question 3 is to determine the probability that both types of error will be present, in a game selected at random from the defined set of all games that were tested. Response D results from erroneously treating the task as one of calculating the probability that *either* one event or the other, *but not both*, will occur. Accordingly, the value given in response D is calculated by adding the individual probabilities of occurrence for each of the two events and then subtracting the probability of their joint occurrence, thus: $0.12 + 0.09 - 0.0108 = 0.1992$. This, however, is not the result the question asks for.

Concluding comments on the quantitative part

Although the quantitative reasoning part covers familiar, basic quantitative topics, the types of question may be a little bit unfamiliar. Nonetheless, if you follow the test taking tips, remain focused, pace yourself, and persevere, you will do well on this part. Again, be sure to *bring your calculator*.

In Closing

We hope you find this guide helpful in preparing for the assessment. Comments on the guide or the assessment itself can be e-mailed to the Bureau of Labor Statistics at [**assessment@bls.gov**](mailto:assessment@bls.gov).